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Applicant: UNILEVER PLC  
Unilever House Blackfriars P O Box 68  
London EC4P 4BQ(GB)

(84)

Designated Contracting States:  
GB

(71)

Applicant: UNILEVER NV  
Burgemeester s'Jacobplein 1 P.O. Box 760  
NL-3000 DK Rotterdam(NL)

(84)

Designated Contracting States:  
BE CH DE FR IT LI NL SE AT

(72)

Inventor: Hayes, Stephen Raymond  
39 Thorns Drive Greasby  
Wirral Merseyside(GB)

(72)

Inventor: Jones, David Philip  
14 Oakfield Road Buckley  
Clwyd Wales(GB)

(72)

Inventor: Lovell, Anthony Leonard  
Cefnbychan Farm Cefnbychan Road  
Pantymwyn Clwyd, Wales(GB)

(74)

Representative: Mole, Peter Geoffrey et al,  
Unilever PLC, Patent Division PO Box 31 Salisbury  
Square House Salisbury Square  
London EC4P 4AN(GB)

(54)

**Packs primarily intended for detergent powder.**

(67)

A pack intended to contain a solid substance such as a detergent powder from which liquid has a tendency to bleed is constructed to reduce the extent of such bleeding. The construction involves the provision on the inside of the pack of a surface having an open-pored structure. The open-pored structure has been found to reduce capillary attraction of liquid for the carton. Open-pored structures can be formed using, for example, non-woven fabrics, foamed board or sintered materials.

**EP 0 070 151 A2**

FIGURE 1

$\delta$	$\beta$	$\delta$	$\beta$
$\beta$	$\beta/\delta$	$\delta$	$\beta$
$\delta$	$\delta/\beta$	$\beta$	$\delta$
$\beta$	$\delta$	$\delta$	$\beta/\delta$

$\delta$	$\beta$	$\delta$	$\beta$
$\beta$	$\beta/\delta$	$\delta$	$\beta$
$\delta$	$\delta/\beta$	$\beta$	$\delta$
$\beta$	$\delta$	$\delta$	$\beta/\delta$

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PACKS PRIMARILY INTENDED FOR DETERGENT POWDER

This invention relates to packs primarily intended for detergent powder, such as drums and cartons.

Some modern detergent powders are formulated with a high proportion of nonionic surfactant in their detergent active component and although strenuous efforts have been made to improve processing techniques, it is still proving difficult to ensure that the nonionic surfactant does not bleed out of the powder. One of the problems which bleeding introduces is that when the powder is packed in conventional cardboard cartons it produces an oily stain which can soak through the cardboard to the printed surface. Apart from attempts to improve processing techniques one approach to solving the bleeding problem is to use cartons which are manufactured from cardboard which is either laminated with wax or with polyethylene or which is coated with an oil-impervious resin.

We have now discovered that bleeding of nonionic surfactants from detergent powders, and indeed bleeding of

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other materials of a similar liquid nature such as per-  
fumes, is at least partly caused by the capillary attrac-  
tion of the cardboard itself, and that if a very open-pored  
surface is presented to a detergent powder, then bleeding  
5 of nonionic surfactant and other oily substances is sub-  
stantially reduced.

Accordingly, in a first aspect the invention provides  
a pack containing a solid substrate having liquid absorbed  
thereon, the liquid having a tendency to bleed from the  
10 substrate, the pack having an open-pored surface on its  
inside face.

In a more limited aspect the invention also provides a  
pack suitable for containing a detergent powder comprising  
a nonionic surfactant or other liquid substance having a  
15 tendency to bleed from the powder, in which the open-pore  
surface on the inside face of the pack is formed by  
applying a non-woven fabric to the sheet material from  
which the pack is formed.

The invention also provides a blank for the pack  
20 described.

It has been previously proposed in the patent  
literature to manufacture sheet material for making packs  
in which the surface designed to be on the inside of the  
packs is of low density or is porous. Examples from this  
25 literature include German Gebrauchsmuster 7000903 in which  
a folded carton has an inside surface coated with velour  
dust so as to be suitable for the packaging of fragile  
articles. Austrian Patent No 248323 is concerned with  
paper which is provided on one side with a layer of thin  
30 porous material such as gauze. The idea behind that is  
that the paper can then be stored in rolls without sticking  
to itself. Other references disclose packs or sheet  
material designed for fire-proofing or for thermal  
insulation. However, none of the references which we are  
35 aware of refer to the use of an open-pore surface on the  
inside of the pack for inhibiting bleeding of liquid from

absorbents, and none of them relate to packs having non-woven fabrics on the inside surface, as the present invention provides.

As has been said, the invention in both its major  
5 aspects relates to a pack having an open-pore surface internally. The latter term is used herein to denote a surface in which the smallest pores are no smaller than the pores in the substrate from which the liquid is expected to bleed. In the case of detergents containing sodium tri-  
10 polyphosphate the minimum pore diameter of the surface will be approximately 0.1-20 microns. Further, the maximum pore diameter is governed by the following consideration, that if the largest pores are larger than the smallest particles in the solid, then some of the powder may stick to the  
15 open-pore surface and not dispense. Consequently it is preferred, though not essential to the invention, that the maximum diameter of the pores is approximately 50-500 microns.

Whilst the second aspect of the invention is limited  
20 to packs lined with non-woven fabric, the open-pore surface referred to in the first aspect may be formed in any desired manner. For example it may be formed by treatment of the sheet material itself from which the pack is made, for example by heat or by spraying with a foamable  
25 material. Where, as is preferred, the sheet material is cardboard, the open-pore surface may even be formed by adding a gassing agent to the surface of the board during the final stage of manufacture. Foamed plastics of the open cell type may also be used as linings for the pack and  
30 these may either be co-formed with or adherent to the sheet material from which the pack is made.

As to the detergent powder which is present in the pack in accordance with the preferred aspect of the invention, this will generally contain from 5 to 25% by  
35 weight of a liquid or pasty nonionic surfactant. Detergent powders containing lower amounts of nonionic surfac-

tant than this generally having sufficient inherent absor-  
bency not to exhibit the bleeding phenomenon. However, the  
powder may still exhibit bleeding due to the presence of  
large amounts of, for instance, mobile perfume components  
5 or polysiloxane anti-foam components.

Turning to the second aspect of the invention, it is  
preferred that the non-woven fabric should be formed from a  
substance which is readily drawn into fibres, for example a  
cellulosic material such as cotton, proteinaceous material  
10 such as wool or silk or hair or other materials such as  
substantially linear plastics polymers, particularly  
acrylic polymers. However, very many other materials can  
be used such as glass and carbon fibre, asbestos and  
polyurethanes.

15 It is preferred that the packs of the first and second  
aspects of the invention are either cylindrical or rec-  
tanguloid. The invention includes the corresponding  
blanks.

The invention is further described and illustrated in  
20 the following examples.

Example 1

In a model experiment two cylindrical tins were taken  
and in each of them a weighed filter paper was sandwiched  
between two 150g layers of a detergent powder having the  
25 formulation shown below. In one instance (the control)  
there was direct contact between the paper and the powder  
and in the other instance a layer of non-woven fabric of  
the type sold by Lohmann as cover stock for disposables  
such as diapers and sanitary towels was first placed on  
30 either side of the filter paper. The tins were then sealed  
and stored for 3 weeks at 37°C. At the end of the period  
the filter papers were removed from the tins and re-  
weighed. The paper which had been in direct contact with  
the powder showed a gain in weight of 56 mgs, whereas that  
35 which had been separated from the powder by a layer of  
non-woven fabric showed no gain in weight whatsoever.



Formulation 1

% by weight

C12-15 primary alcohol ethoxylate 7EO	17.1
Sodium tripolyphosphate	51.4
Sodium silicate (alkaline)	14.3
5 Sodium carboxymethyl cellulose	1.4
Water and minor components	to 100.0

This model experiment demonstrates the efficacy of a non-woven fabric in counteracting the considerable capillary attraction which filter paper can exert on a liquid absorbed in a detergent powder.

Example 2

Two identical cardboard blanks printed on one side were taken and one of them coated on the unprinted side by adhesion of a sheet of non-woven fabric. The blanks were formed into cartons, filled with the formulation described below and sealed. They were then stored for 3 months at 37°C.

At the end of this period the printing ink on the exterior of the control carton was smudged and had migrated to parts of the carton where it was not wanted, producing an unsightly mess. The carton in accordance with the invention, on the other hand, appeared as it had done prior to storage. Photographs of the cartons are shown in figures 1, 2 and 3.

25 <u>Formulation used in Example 2</u>	<u>% by weight</u>
C14-15 primary alcohol ethoxylate 13EO	3.1
C12-15 primary alcohol ethoxylate 7EO	5.0
Sodium sulphate	60.1
Sodium carbonate	19.7
30 Sodium silicate (alkaline)	8.3
Water and minor components	to 100.0

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This experiment confirms the efficacy of a thin layer of non-woven fabric in protecting a cardboard carton from the effects of bleeding from a detergent powder.

**CLAIMS:**

1. A pack containing a solid substrate having liquid absorbed thereon, the liquid having a tendency to bleed from the substrate, the pack having an open-pored surface on its inside face.
2. A pack according to claim 1 suitable for containing a detergent powder comprising a liquid substance having a tendency to bleed from the powder, in which the open-pored surface on the inside of the pack is formed by applying a non-woven fabric to the sheet material from which the pack is formed.
3. A pack according to either of the preceding claims in which the pore diameter of the open-pored surface has a maximum of 50-500 microns.
4. A blank for a pack according to any one of the preceding claims.

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FIGURE 1

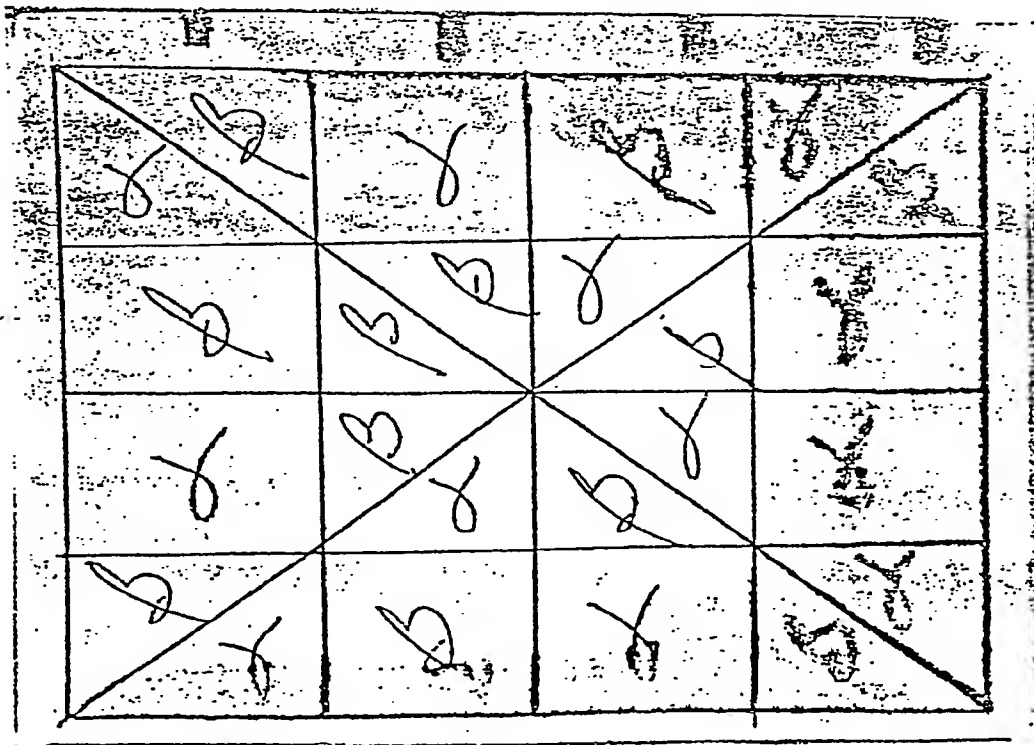
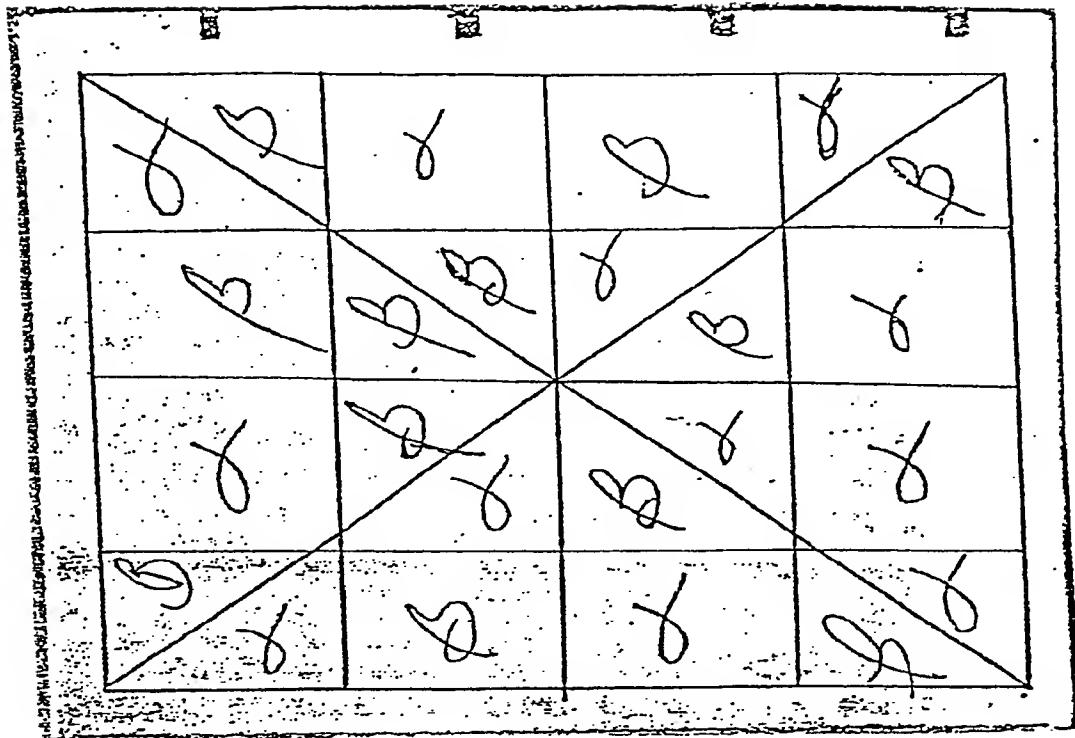
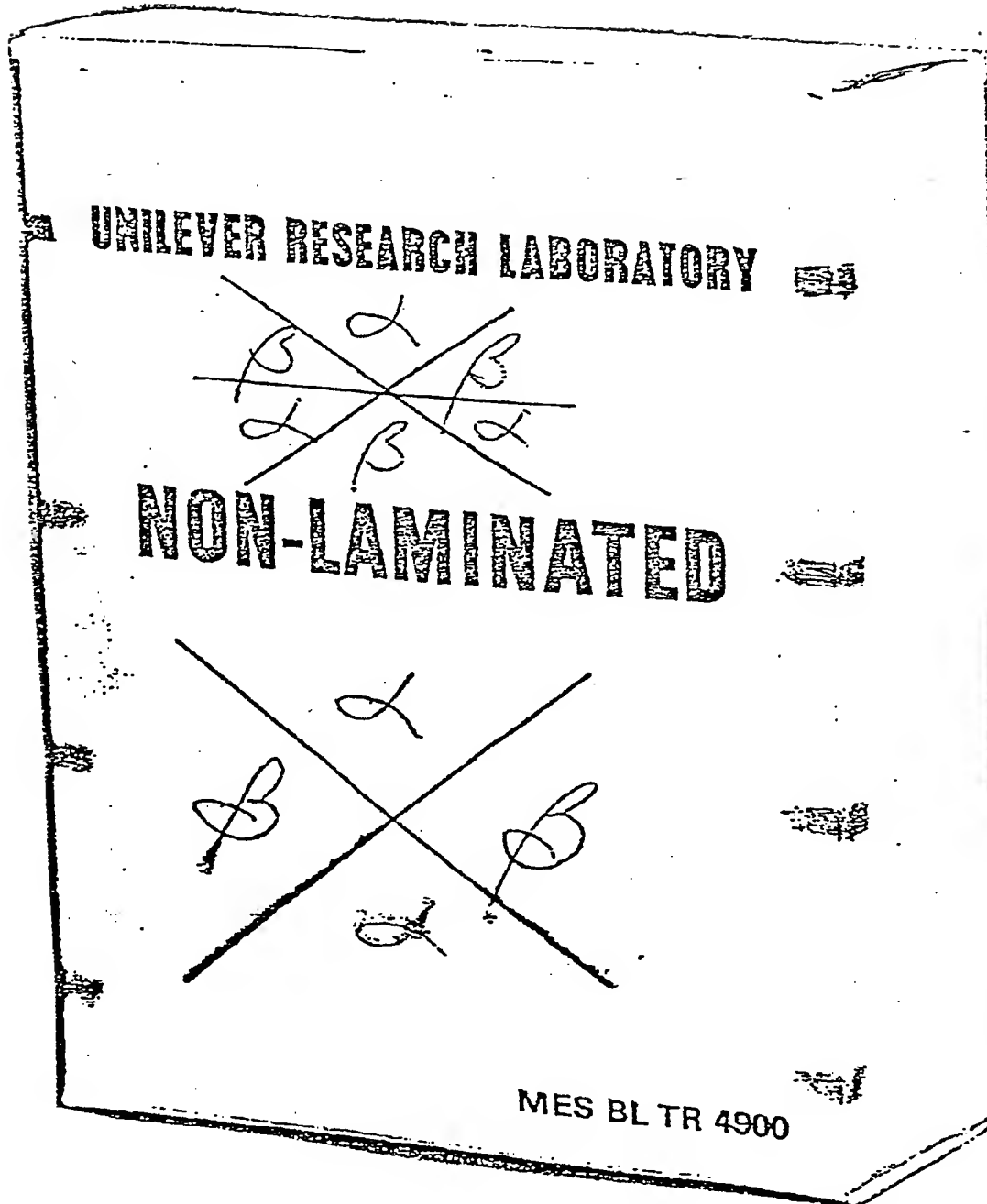


FIGURE 2.



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FIGURE 3

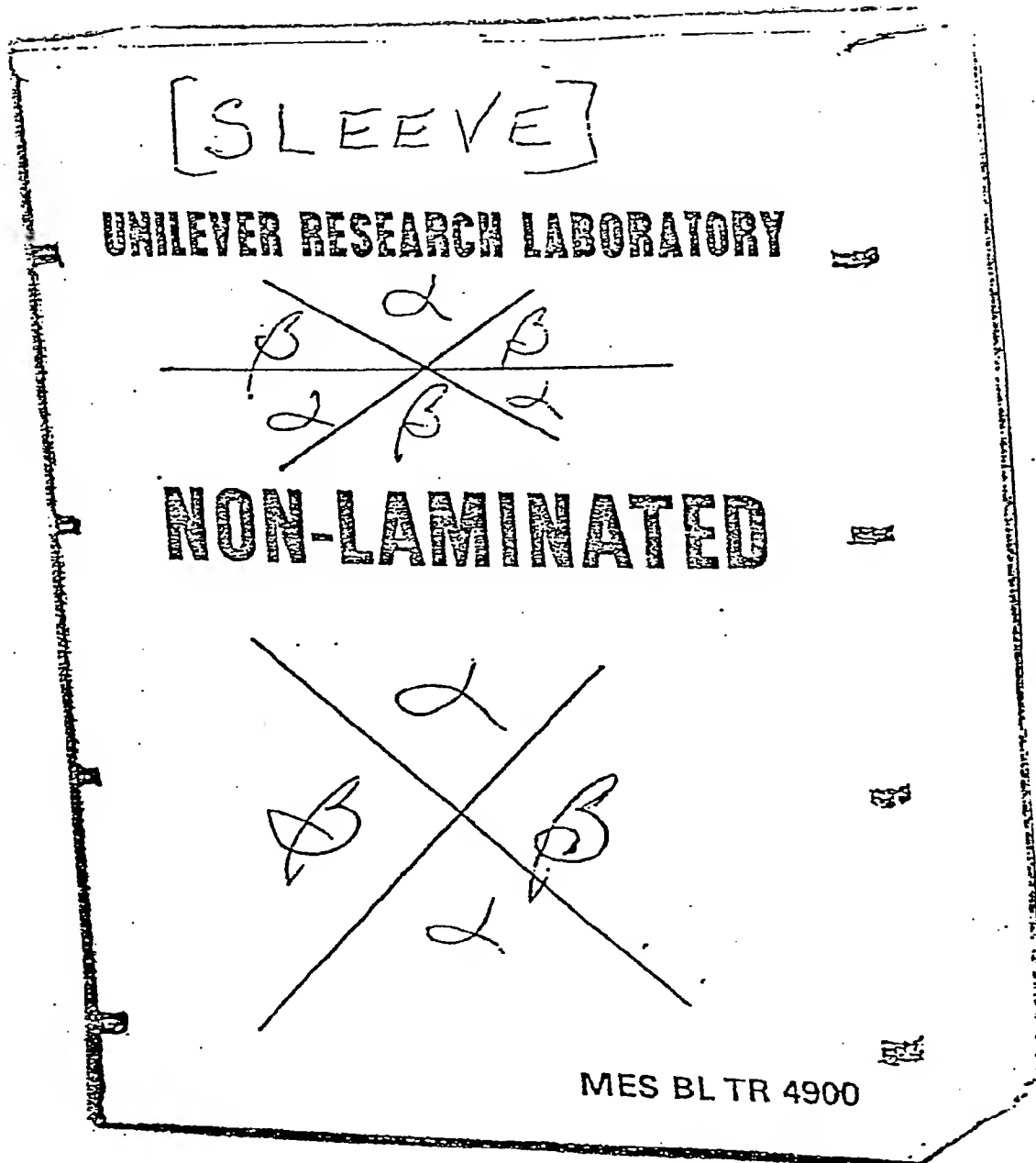


FIGURE 1

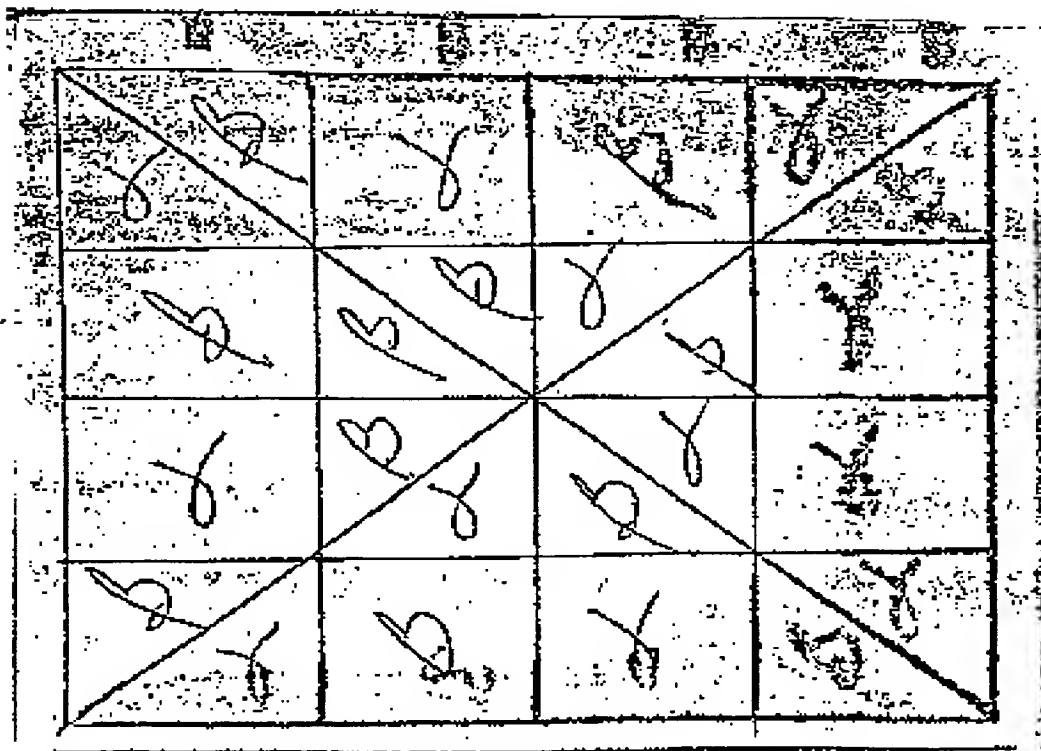
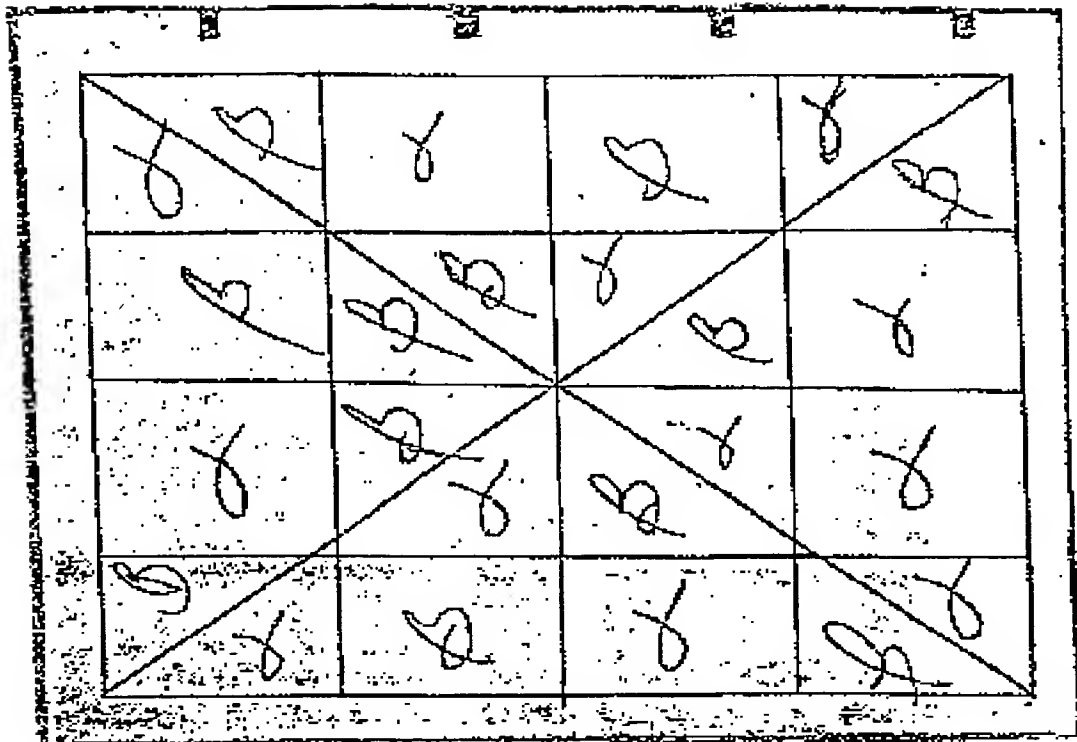
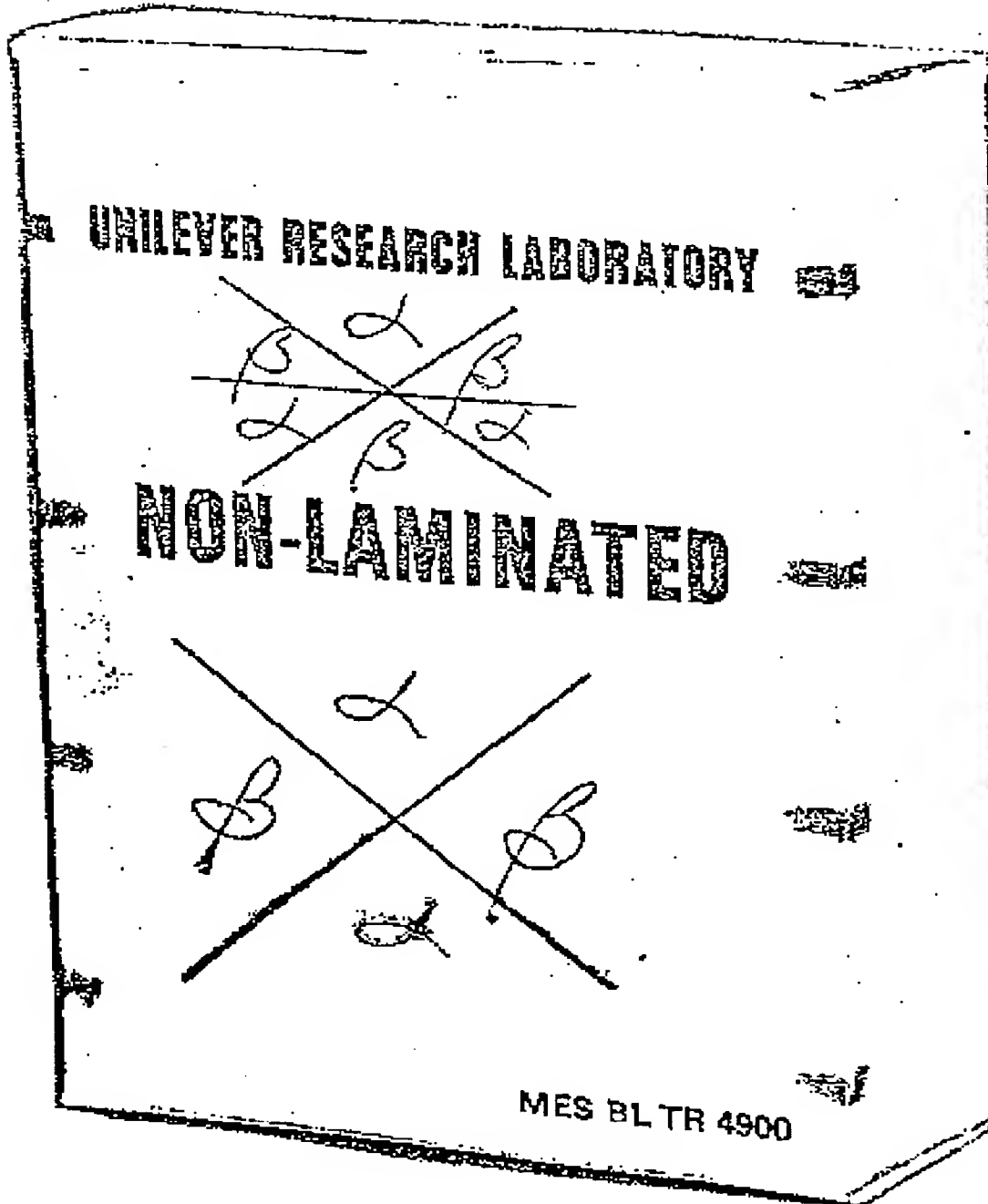


FIGURE 2.

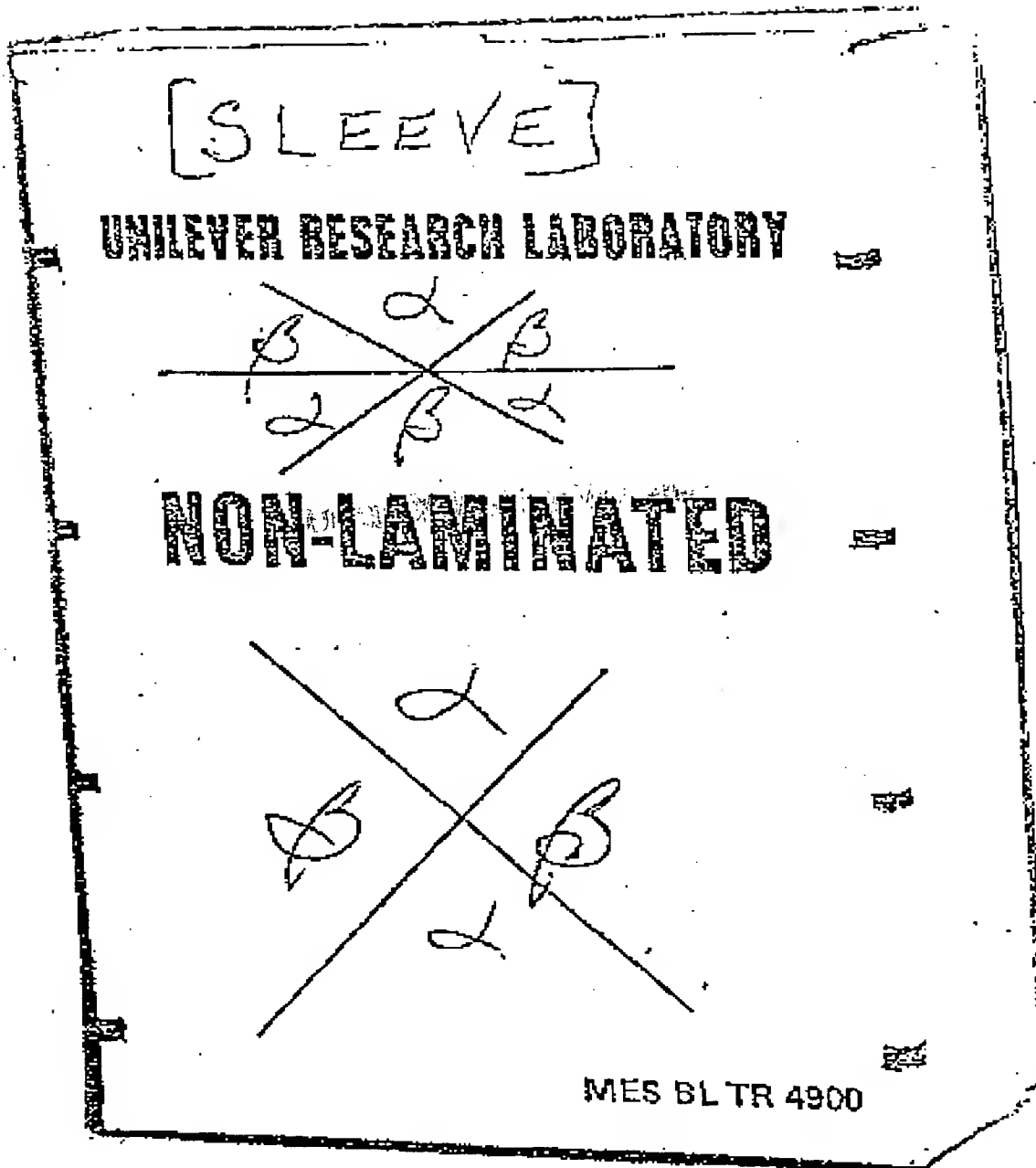




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FIGURE 3



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71 Applicant: UNILEVER PLC  
Unilever House Blackfriars P O Box 68  
London EC4P 4BQ(GB)

84 Designated Contracting States:  
GB

71 Applicant: UNILEVER NV  
Burgemeester s'Jacobplein 1 P.O. Box 760  
NL-3000 DK Rotterdam(NL)

84 Designated Contracting States:  
BE CH DE FR IT LI NL SE AT

72 Inventor: Hayes, Stephen Raymond  
39 Thorns Drive Greasby  
Wirral Merseyside(GB)

72 Inventor: Jones, David Philip  
14 Oakfield Road Buckley  
Chwyd Wales(GB)

72 Inventor: Lovell, Anthony Leonard  
Cefnbychan Farm Cefnbychan Road  
Pantymwyn Chwyd, Wales(GB)

74 Representative: Mole, Peter Geoffrey et al,  
Unilever PLC, Patent Division PO Box 31 Salisbury  
Square House Salisbury Square  
London EC4P 4AN(GB)

54 Packs primarily intended for detergent powder.

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# EUROPEAN SEARCH REPORT

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Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 82303579.5
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 7)
A	DE - A1 - 2 608 861 (THE PROCTER) * GB-A-1 549 761 -----		B 65 D 5/00 B 65 D 81/26
			TECHNICAL FIELDS SEARCHED (Int. Cl. 7)
			B 65 D 5/00 B 65 D 65/00 B 65 D 81/00
X The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 14-12-1982	Examiner CZUBA
<b>CATEGORY OF CITED DOCUMENTS</b>			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons  & : member of the same patent family, corresponding document	

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